

Amendments to the Specification

Please replace the second paragraph on page 5
(beginning at line 7) with the following amended paragraph:

In order to understand the invention and to see how it
maybe carried out in practice, a preferred embodiment will now
be described, by way of non-limiting example only, with
reference to the accompanying drawings, in which:

Fig. 1 shows a digital image showing distortion due to
out of focus optics;

Fig. 2 shows a histogram of heights of steps in the image
of Fig. 1; and

Fig. 3 shows the result of rectifying the image of Fig. 1
in accordance with the invention; and

Fig. 4 shows a system for digital image processing in
accordance with an embodiment of the invention.

Please replace the third paragraph on page 5
(beginning at line 15) with the following amended paragraph:

In a preferred embodiment, as shown in Fig. 4, a system
20 for digital image processing comprises a camera 22 and an
image processor 24 (which may be a separate unit as shown or
may be integrated in the camera). The camera typically
comprises objective optics 26, having a certain point spread
function (PSF). Optics 26 focus an image onto an image sensor

28, comprising multiple pixels 30. Image sensor 28 outputs an image that is distorted, for reasons explained below. Digital image processor 24 processes the image to remove noise and distortion. The image processor may comprise a programmable processor, which operates in accordance with program instructions stored in a program storage device 32. ~~prior~~
Prior to removing noise from the distorted image $B_0(x)$, the function $B_0(x)$ is preprocessed as follows. Firstly, if the output signal $B_0(x)$ from the digital camera is not linear with the input intensities $I(x)$, the image $B_0(x)$ is transformed to make the signal linear with the intensity. This is accomplished by applying to the signal $B_0(x)$ the inverse transformation that was applied by the camera to the intensities in order to produce the signal $B(x)$. For example, if the camera performs a transformation on the intensity of the form $B(x) = A(A^{-1}I(x))^\gamma$, where A is a scaling factor and γ a fixed exponent, the signal $B_0(x)$ is transformed by $A(B_0(x)/A)^{\gamma^{-1}}$ to obtain a new $B(x)$. For many digital cameras, $\gamma=1/3$ in order to make the obtained image more pleasing to the eye. The function $B(x)$ is then transformed so as to decay smoothly at the edges to zero in order to make the image periodic at the edges. The function $B_1(x)$ produced by this preprocessing is operated on in accordance with the invention as described in detail below.